

What is claimed is:

1. A ceramic honeycomb structure comprising a plurality of through-holes surrounded by partition walls, wherein a thermal expansion coefficient of an outer circumferential wall portion in the ceramic honeycomb structure is larger than a thermal expansion coefficient in a direction of a diameter of an inside partition wall portion in the ceramic honeycomb structure, and stress is applied to the inside partition wall portion from the outer circumferential wall portion.
2. A ceramic honeycomb structures as defined in claim 1, wherein a material for the outer circumferential wall portion of the ceramic honeycomb structure is the same as or different from a material for the ceramic honeycomb structure.
3. A ceramic honeycomb structure as defined in claim 1, wherein a partition wall of the ceramic honeycomb structure has a thickness of less than 0.1mm.
4. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has 62 cells/cm<sup>2</sup> or more.
5. A ceramic honeycomb structure as defined in claim 1, wherein the outer circumferential wall portion is thicker than an inside partition wall portion of the ceramic honeycomb structure.
6. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has an open frontal

area of 86% or more.

7. A ceramic honeycomb structure as defined in claim 1, wherein the ceramic honeycomb structure has a bulk density of  $0.26\text{g/cm}^3$  or less.